



Aerospace Medicine

**IONIZING RADIATION PROTECTION
PROGRAM (IRPP)**

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This instruction implements and reflects 10 CFR Part 20, *Standards for Protection Against Radiation*, and 10 CFR Part 19, *Notices, Instructions and Reports to Workers: Inspection and Investigations*, published by the US Nuclear Regulatory Commission (USNRC). It establishes requirements for conducting the Osan AB IRPP and implementing the as low as reasonably achievable (ALARA) concept. It also outlines the quality assurance requirements to ensure radiation exposures are kept ALARA. This instruction describes the responsibilities of all personnel involved with the control and use of radioactive material (RAM) and Radiation-Producing Devices (RPDs). It also describes necessary procedures for the implementation of an effective radiation safety program and applies to all assigned, attached, and associate organizations at Osan AB, and all collocated operating bases and/or geographically separated units under 51 FW and/or 607 ASG jurisdictions. Governing directives for the radiation protection program are DoDI 6055.8, *Occupational Radiation Protection Program*, AFI 40-201, *Managing Radioactive Materials in the USAF*, AFI 48-125, *The USAF Air Force Personnel Dosimetry Program*, and AFI 48-148, *Ionizing Radiation Protection*.

SUMMARY OF REVISIONS

Installation RSO is changed to base RSO. Base RSO and unit RSO responsibilities are updated. The 2005 version of the Radiation Protection Program requirements for users of Chemical Agent Monitor (CAM), Improved Chemical Agent Monitor (ICAM), Automatic Chemical Agent Detection Alarm (ACADA or M-22A1), and Chemical Agent Alarm (CAA or M-43A1) are established. New or revised material is indicated by a bar (|).

1. Air Force Policy: Air Force policy mandates that all exposures to ionizing radiation will be ALARA. There should be no exposure to ionizing radiation without an expected benefit and the dose received should be the lowest possible, consistent with the state of technology, costs, and operational requirements.

2. Responsibilities at Wing Level:

2.1. 51 FW/CC will:

2.1.1. Appoint Bioenvironmental Engineers, or other individual with equivalent radiation experience, as the primary and alternate base Radiation Safety Officer (RSO).

2.1.2. Ensure the base RSO is notified of all planned uses of radioactive material on the base.

2.1.3. Ensure all RAM shipments within the base are coordinated with the base RSO.

2.2. 51 AMDS/SGPB will:

2.2.1. Ensure qualified 43E3A Bioenvironmental Engineers or 4B07/91 Bioenvironmental Engineering Technicians are appointed as the primary and alternate base RSO.

2.2.2. Develop a formal IRPP to ensure all radiation exposures comply with ALARA requirements. Coordinate with each unit RSO to ensure that a comprehensive base-wide IRPP exists. Provide consultation to unit RSOs in the development of local guidance and publications consistent with the ALARA concept.

2.2.3. Perform surveillance of areas where radiation sources are used or stored.

2.2.4. Review all plans for modification, design, or deployment of RPD or material and/or storage/use locations under the control of 51 FW.

2.2.5. Manage the USAF Personnel Dosimetry Program: The investigation action level for Osan AB is established at 25 millirems (mrem) per month or 75 mrem per quarter. These levels are investigated and their results reported to the Aerospace Medicine Council.

2.2.6. Accomplish and document IRPP reviews and present results to organization commanders and to the 51 FW Integrated Safety Council.

2.2.7. Document ALARA training classes are being conducted at least annually for all radiation workers. Tailor the level of training to the specific category of personnel and hazard potential. Include information regarding risk from radiation exposure; health risks to children of women occupationally exposed to radiation during pregnancy; maximum permissible dose limits; protective measures required (tailored for specific radiation work); and ALARA concept and practice.

2.2.8. Perform package swipes on shipments containing RAMs and ensure shipping requirements are met in accordance with 49 CFR 173, 10 CFR 20, and AFI 40-201.

2.2.9. Survey broken or damaged containers to determine the extent of radiological hazards and direct recovery actions as necessary.

2.2.10. Investigate incidents of alleged or actual radiation exposures in accordance with AFI 40-201 and AFI 91-204, *Safety Investigations and Reports*.

2.2.11. Establish procedures in conjunction with 51 CES/CEC to review and approve/disapprove contractor requests to bring radioactive materials or RPDs on base or to conduct work involving such materials or equipments on base.

3. Responsibilities at Unit Level:

3.1. Commanders (of units that own or use RAMs or RPDs) will:

- 3.1.1. Appoint a primary and alternate unit RSO in writing (to include name, rank, office symbol, duty phone, and DEROs) and provide a copy of the appointment letter to the base RSO (51 AMDS/SGPB), including any subsequent changes.
- 3.1.2. Ensure an inventory identifying the locations of all required RAMs or RPDs is compiled in June and December of each year with a copy provided to the base RSO.
- 3.1.3. Inform the base RSO (51 AMDS/SGPB) of any changes that could alter existing ionizing radiation device.
- 3.1.4. Establish control procedures to ensure only authorized personnel have access to RAMs or RPDs.
- 3.1.5. Ensure a Radioactive Material Management and Safety Program is established for all radioactive material permits.
- 3.1.6. Ensure personnel receive initial and annual training on ALARA concepts, unit radiation sources, and safety procedures by the unit radiation safety officer and document the training on individual's AF IMT 55, **Employee Safety and Health Record**.
- 3.1.7. Obtain and manage USAF RAM Permits as needed per AFI 40-201.
- 3.1.8. Units which distribute permitted RAMs (e.g., CAM, ICAM, M-22A1, etc.) during exercises and contingencies will ensure that receiving personnel:
 - 3.1.8.1. Are trained to use the item which they receive.
 - 3.1.8.2. Have received ALARA training prior to receipt of the item.
 - 3.1.8.3. Ensure all items are accounted for and report discrepancies to the base RSO (51 AMDS/SGPB).
- 3.1.9. Ensure that items containing RAM under a NRC General License are identified to the base RSO for registration with the USAF Radioisotope Committee (RIC).
- 3.1.10. Ensure that if CAM, ICAM, M43A1, M8A1, or ACADA (M22A1) are used, the requirements of the *USAF Radiation Protection Program for the M43A1/M8A1 Chemical Agent Alarm (CAA), Chemical Agent Monitor (CAM), Improved Chemical Agent Monitor (ICAM) and GID-3 Automatic Chemical Agent Detector/Alarm(ACADA)*, March 2005 (Revision 3) are followed. This guide is available from the base RSO and at http://www.abwem.wpafb.af.mil/radiation/Docs/CAM_Radiation_Protection_Program3.pdf.

3.2. Unit RSOs will:

- 3.2.1. Act as a point of contact on ionizing radiation safety matters for the unit and maintain active liaison with the base RSO.
- 3.2.2. Establish a Radiation Safety Protection Program. Ensure personnel receive initial and annual ALARA training.
- 3.2.3. Prepare unit Radiation Safety Operating Instructions and coordinate all operating instructions through Bioenvironmental Engineering Flight (BEF) (51 AMDS/SGPB) for review and final approval.
- 3.2.4. Ensure all transfers or receipts of RAM are coordinated with the base RSO in advance.

- 3.2.5. Ensure the receipt, possession, distribution, use, transfer, and disposal of RAMs is accomplished according to the specific conditions of the applicable USAF RAM Permit.
 - 3.2.6. Immediately report any accident, fire, theft, or loss involving RAMs to the base RSO, and also any suspected overexposures to ionizing radiation.
 - 3.2.7. Maintain copies of all BEF surveys and all radiation safety training documentations.
 - 3.2.8. Track all unit actions needed to eliminate ionizing radiation hazards to personnel. Ensure all corrections are made in a timely manner. Ensure required warning signs are properly posted.
 - 3.2.9. Coordinate BEF surveys with unit commander and supervisors, and ensure that personnel are informed of the status of such activities.
- 3.3. Supervisors (of personnel using or working on RAMs or RPDs) will:
 - 3.3.1. Obtain ALARA training from BEF upon assignment as supervisor; unless previously trained as a supervisor and documented on individual's AF IMT 55.
 - 3.3.2. Ensure all personnel using or working on RAMs or RPDs receive ALARA training from BEF upon assignment and annually thereafter.
 - 3.3.3. Review and implement measures to comply with requirements published in USAF RAM Permits, DoDI, AFI, T.O., and this instruction.
 - 3.3.4. Maintain thermo-luminescent dosimeters (TLDs) to ensure proper control of badges and train personnel on the local procedures established to prevent unintentional radiation exposure to badges. Send newly assigned personnel to BEF to receive TLDs and obtain fundamental training on ALARA and TLD wearing, storage, and handling.
 - 3.3.5. Ensure workers handling RAM report to the hospital if they receive cuts or abrasions while in the work area.
 - 3.3.6. Immediately report any accident, fire, theft, or loss involving RAMs to the unit RSO and base RSO.
 - 3.3.7. Immediately report suspected overexposures to ionizing radiation to the unit RSO and base RSO.
 - 3.3.8. Brief workers on the results of all BEF surveys of their work areas.
 - 3.4. Workers (individuals using or working on RAMs or RPDs) will:
 - 3.4.1. Wear their assigned TLD badges, if required, whenever working with RAMs or RPDs.
 - 3.4.2. Review and comply with requirements published in USAF RAM Permits, DoDI, AFI, T.O., and this instruction.
 - 3.4.3. Promptly inform their supervisors of any suspected accidental exposure, cut, or skin abrasion while handling RAMs.
 - 3.5. 51 CES/CEC will: Ensure all plans for modification or design of facilities involving the use of RAMs or RPDs are reviewed by the base RSO.
 - 3.6. 51 LRS/LGRT will:

- 3.6.1. Notify 51 AMDS/SGPB (BEP) to survey any radioactive item terminating shipment at Osan AB; any radioactive item leaving Osan AB; and/or any radioactive waste containers prior to shipment.
 - 3.6.2. Pack, mark, and label radioactive waste in accordance with CFRs, AFIs, and when applicable, follow instructions provided for transportation by the radioactive waste generator.
 - 3.6.3. Ensure personnel trained in the movement and packaging of RAM are available at all times.
 - 3.6.4. Maintain a proper holding area to temporarily store items that contain RAMs or radioactive wastes.
- 3.7. 607 ASG will: Maintain proper storage areas at the applicable collocated operating bases for RAMs.

4. Reporting Radiological Incidents:

- 4.1. Any accident, fire, theft, loss, or suspected overexposures involving RAMs must be immediately reported to the unit RSO and base RSO.
 - 4.1.1. Radiological incident reporting instructions, including the 24-hour contact phone numbers of the primary and alternate unit RSO and the base RSO, must be posted outside the entrance to any storage room containing RAMs.
 - 4.1.2. Radiological incident reporting instructions must be included in the unit's health and safety briefing for newcomers to ensure all personnel are aware of reporting requirements.
 - 4.1.3. The base RSO may be contacted at 51 AMDS/SGPB during normal duty hours (784-2623). After hours, he/she may be paged through the 51 MDG Emergency Room (784-2500).

JOSEPH REYNES, JR., Brigadier General, USAF
Commander

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION****References**

AFI 40-201, *Managing Radioactive Materials in the USAF*

AFI 48-125, *The USAF Personnel Dosimetry Program*

| AFI 48-148, *Ionizing Radiation Protection*

AFI 91-204, *Safety Investigations and Reports*

DoDI 6055.8, *Occupational Radiation Protection Program*

Title 10, *Code of Federal Regulations, Energy*

Title 49, *Code of Federal Regulations, Parts 170 through 189, Transportation.*

Terms

ALARA (As Low As Reasonably Achievable)—is a principle of ionizing radiation protection mandated by the U.S. Nuclear Regulatory Commission (10 CFR 20.1003) for its licenses to make every reasonable effort to maintain radiation exposures as far as below the limits as is reasonably achievable. In the USAF, ALARA is a set of management and administrative actions taken to reduce personnel radiation dosage to as low a level as possible consistent with operational requirements. The ALARA concept was developed in response to scientific evidence that suggests no level of radiation exposure is totally risk free. While the established maximum permissible doses are conservative and offer a low risk of adverse health effects compared to other hazards, every effort should be made to reduce exposures to the lowest possible.

Individual User—Any individual who uses or supervises the use of radioactive material or an item containing radioactive materials.

| **Radiation Producing Devices (RPDs)**—Equipments capable of generating ionizing radiation such as an x-ray machine.

Radiation Safety Officer (RSO)—An individual who provides consultation and advice on the hazards associated with radiation and the effectiveness of measures to control these hazards. There are three categories of RSOs:

| **Base RSO**:—An individual designated by the 51 FW/CC to manage the base IRPP.

Permit RSO—An individual approved by the USAF Radioisotope Committee to manage the radiation protection aspects associated with the use of radioactive materials for which a specific USAF RAM Permit has been issued.

| **Unit RSO**—An individual designated by the unit commander to act as a focal point for the unit on radiation protection matters. Each unit that operates RPDs or uses radioactive materials appoints a unit RSO.

Radioactive Material (RAM)—Material that contain radioactive isotopes or generate ionizing radiation.

| **Thermo-luminescent Dosimeter (TLD)**—A passive radiation monitoring device consisting of a Thermo-luminescent card and holder. The whole body TLD monitors for beta, gamma, and x-ray

exposures.

USAF Radioactive Material Permit (RAM Permit)—A written authorization from the USAF Radioisotope Committee (RIC) for USAF organizations to receive, possess, distribute, use, transfer, or dispose of specific radioactive materials.

USAF Radioisotope Committee (RIC)—A committee established to provide USAF administrative surveillance over all radioactive materials.

Generator (waste)—For items controlled under a USAF RAM Permit issued to a specific organization, the using activity of the permitted organization will be considered the generator. For commodity type items not covered under a specific USAF RAM Permit, the generator will be the person or activity with property accountability for the item when it is designated as waste.